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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/553,260 | 11/08/2006 | Charles Mioskowski | BJS-1721-100 | 1828 |
| 23117 | 7590 | 07/25/2008 | EXAMINER | |
| NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203 | | | | LE, HOA T |
| ART UNIT | | PAPER NUMBER | | |
| 1794 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/553,260 | MIOSKOWSKI ET AL. |
| | Examiner | Art Unit |
| | H. T. Le | 1794 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 04 April 2008.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-17 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-17 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 9, 10 and 12 are rejected under 35 U.S.C. 112, first paragraph,** because the specification, while being enabling for applying an electric field to remove the polymerized lipids rings from nanotubes, does not reasonably provide enablement for any method other than the application of an electric field. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The only method applicable to remove the lipid rings surrounded the nanotubes is subjecting the nanotubes to an electric field. Claims 9, 10 and 12 which fail to include such critical feature are deemed broader than the enabling disclosure.

4. **Claim 13 is rejected under 35 U.S.C. 112, first paragraph,** because the specification, while being enabling for applying sonification to shorten the polymerized lipid-coated nanotubes, does not reasonably provide enablement for any treatment other than sonification. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or the invention commensurate in scope with these claims. The only method described in the

specification for controlled shortening of the nanotubes is sonification. And because sonification tends to damages the sides and ends of unprotected nanotubes, nanotubes are first protected by polymerizing lipid rings around the nanotubes to prevent damaging of the nanotubes during shortening. This fact is an evidence that only sonification is envisioned as a method of shortening nanotubes. Claim 13 which describes a broad “chemical fragmentation process” for shortening the nanotubes is deemed broader than the enabling disclosure.

5. **Claims 14-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

5.1. Claims 14 and 16: Claims 14 and 16 have no support in the specification. Stripping off polymerized lipid rings from the nanotubes will not provide nanotubes that are capable of solubilizing hydrophobic molecules as described in the claim. The part that solubilizes the hydrophobic molecules is the polymerized lipid ring due to its hydrophobic interior and hydrophilic exterior; That is, the polymerized lipid ring must be first removed from the nanotube and then recovered (without the nanotube) to be utilized as vectors for hydrophobic molecules or membrane proteins. There should be no nanotubes present during the solubilizing step as described in claims 14 and 16.

5.2. Claim 15 has no support in the specification. The specification discloses reducing the polymerized lipid rings around the nanotubes to a few rings in order to

make the nanotubes suitable as nanomotors. However, it does not describe how such process is applied. No where in the specification describes "decorating" nanotubes with cellular motor proteins as described in claim 15. Cancellation of claim 15 is required to obviate this rejection.

5.3. Claim 17 describes hydrophilic head being a sugar or polysaccharide is incorrect. The hydrophilic head is a moiety of a sugar or polysaccharide, but is not by itself a sugar or polysaccharide.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 9-12, 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention.

Examiner's Note: The specification describes covering nanotubes with polymerized lipid rings in order to facilitate shortening the nanotubes by sonification without damaging the nanotubes. The polymerized lipid-covered nanotubes can also be further purified to remove impurities, NOT lipid rings, from the nanotubes. The specification further describes detaching the polymerized lipid rings from the nanotubes by applying of electric field, and recovering the polymerized lipid rings for application as vectors in hydrophobic molecules or membrane proteins. However, claims 9-12, 14 and 16 fail to correspond to the descriptions in the specification for the reasons set forth below.

7.1. Claims 9-12: It appears that claims 9-12 mixed up the process of purifying polymerized lipid ring-coated nanotubes and the method of removing the lipid rings around the nanotubes.

7.1.a. Claims 9-10: Claim 9 recites a method of purifying nanotubes by detaching the polymerized lipid rings from the nanotubes, and claim 10 describes such method as "size exclusion chromatograph". Claims 9 and 10 fail to correspond in scope with what Applicants describes in the specification as their invention. The purification of lipid-surrounded nanotube does not result in stripping the lipid rings off the nanotube but removing impurities from the nanotube. See paragraph bridging pages 3 and 4 where it states in part:

"...the structures obtained are subjected to a treatment for separating the nanotubes surrounded by polymerized lipid rings from all the impurities contained in the nanotube synthesis medium."

In addition, at page 9, lines 20-33, it is described that the purified nanotube is a dry specimen of "clean nanotubes covered with polymerized lipids".

These descriptions indicate that the invention is different from what is defined in the claims 9 and 10.

7.1.b. Claims 11-12: Claims 11 and 12 describe the purification as the method of stripping off polymerized lipid rings from the nanotubes which is incorrect as discussed in 7.1.a. above. Removal of the rings by electric field is not part of the purification method.

7.2. Claims 14 and 16: These claims falsely describe the invention as disclosed in the specification. Stripping off polymerized lipid rings from the nanotubes will not

provide nanotubes that are capable of solubilizing hydrophobic molecules as described in the claims. The part that solubilizes the hydrophobic molecules is the polymerized lipid ring, after having been detached and recovered, due to its hydrophobic interior and hydrophilic exterior; That is, the polymerized lipid ring must be first removed from the nanotube and then recovered (without the nanotube) to be utilized as vectors for hydrophobic molecules or membrane proteins. There should be no nanotubes present during the solubilizing step as described in claims 14 and 16.

8. Claims 9, 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 9, line 2, "are" should be "is".

In claims 14 and 16, it is unclear what is being stripped off the nanotubes.

9. It is requested that Applicants review the specification carefully to properly claim Applicant's own invention. It's puzzling that there is such drastic discrepancy and confusion between the disclosure and the claims. It is suggested that Applicant cancel claims 9-16.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 9:30 a.m. to 6:00 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. (Holly) T. Le/
Primary Examiner, Art Unit 1794

July 18, 2008